What are two of the most common misconceptions about cognitive rigor and Depth of Knowledge/DOK?

⚠️ Rigor Misconception # 3

**Verbs and levels in Bloom’s Taxonomy can be equated with Depth-of-Knowledge levels.**

Have you seen that visual of a wheel divided into 4 DOK levels? Each section is filled with a list of verbs. I’ve come to call this, ‘The DOK Wheel of Misfortune’ because it implies that if you spin the wheel and pick a verb, voila! Your students will be thinking deeply. In fact, if you examine this wheel carefully, you will see many of the same verbs recurring in multiple sections of the wheel. That should be your first red flag about verbs determining complexity levels. I am frequently asked about the wheel, so it’s worth stating here that neither Norman Webb nor I created it. It may have been derived from a Bloom’s Taxonomy wheel that long ago appeared in Barbara Clark’s book, *Growing Up Gifted* (1983, p. 222). In Clark’s book, the wheel also had verbs in each of the sections that represented levels of Bloom’s Taxonomy. Clark used the Bloom wheel to make the case that rather than seeing it as a linear hierarchy, the taxonomy should be viewed as a repeating cycle: the highest levels of thinking produce new insights and products that lead to a need to go back and expand upon the original knowledge base. That in turn leads to much deeper understanding in the next cycle. The same could be said of how to view Depth-of-Knowledge levels – guiding a continuous cycle of learning.

The DOK wheel implies a connection that really doesn’t exist. Here is what we know about using “verbs” as the primary indicator of task complexity and deeper thinking:

1. Verbs are generic, void of content. Thinking and accessing information stored in long-term memory is domain specific, not simply generic mental processing. To analyze a literary text requires a different schema and thought process than analyzing an experimental design, or analyzing a work of art. “Teaching for transfer within each discipline aims to increase transfer within that discipline. Research to date provides little guidance about how to help learners aggregate transferable competencies across disciplines. This may be a shortcoming in the research or a reflection of the domain-specific nature of transfer” (NRC, 2012, p. 7).
2. Verbs describe a type of thinking, not the depth of understanding.
3. The same verbs sometimes appear at multiple levels in taxonomies, making them less meaningful and more subjective when coming to consensus on determining the level of cognitive complexity of a given test item or task.
4. It’s actually what comes after the verb – the content – and the engagement with that content that helps us to determine the complexity of the task. Not the verb.
### Table 1.1: Unpacking higher order thinking verbs

<table>
<thead>
<tr>
<th>The “Verb”</th>
<th>What the student is expected to do…</th>
<th>Examples of prompts at each DOK level</th>
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| Analyzing  | Analyzing is most closely associated with critical thinking. It means taking things apart to understand how the parts relate and work together as a whole. The primary purpose of analysis is to build an understanding of schema in each content domain. We take a novel apart to understand how literary elements interact to achieve an intended purpose. We take science investigations apart to understand how the experimental design leads to control of variables, data collection, and valid interpretations based on evidence. Comparing-contrasting or distinguishing fact-opinion are at the lower end (DOK 2) of the analysis continuum – “analysis lite.” Analyzing discourse styles of authors or how different data displays can influence interpretations require deeper and more generalized understandings – “analysis deep.” | DOK 1  
Is this realistic fiction or a fantasy story?  
DOK 2  
Compare how the wolf character and Red Riding Hood are alike-different.  
DOK 3  
Is this realistic fiction or a fantasy story? Justify your interpretation analyzing text evidence.  
DOK 4  
Are all wolves (in literature) like the wolf in this story? Support your response analyzing evidence from this and other texts. |
| Evaluating | Evaluating begins with analysis in order to make an evidence-based judgment. Evaluation also requires the use of “established” criteria to guide analysis of the kind of evidence that should be used to support a claim or thesis in a particular context. For example, judging the effectiveness of a musical performance requires different criteria than evaluating flaws in an experimental design. Each content domain has organizational schemas, terms and principles, and ways of thinking about how to judge “expert” performances or products. The methodologies and set of agreed-upon criteria for evaluation are unique to each domain, such as using criteria for evaluating character archetypes (e.g., who really is the hero?) or critiquing the reasoning and models used to arrive at a solution in mathematics (e.g., who is correct or are they both correct?). | DOK 1/2  
Did you like the story?  
DOK 3  
What is your opinion about the cleverness of the wolf? Justify your opinion analyzing text evidence.  
DOK 4  
Which version’s ending has the most emotional impact? (Establish criteria first, then locate and analyze evidence.) |
| Creating   | In the original Bloom’s Taxonomy (1956), this higher-order level was called “Synthesis” and it was not placed at the top of the taxonomy. In the Revised Bloom’s Taxonomy (Anderson, Krathwohl, et. al, 2001), this level was moved to represent the highest order of thinking and the word “synthesis” was changed to “create” which seems to better represent the intent – producing something new. Creating is in some ways the opposite of analysis/critical thinking (Hess & Gong, 2014). When we think critically, we take things apart to build an understanding of schema. When we create, we put parts together in different or innovative ways to reframe how to look at ideas or to find alternative solutions. Don’t be fooled into thinking that every fun and engaging learning activity that results in students creating something is at the deepest level of thinking! Fun and engaging assignments are a means to deeper understanding, not an end. | DOK 1  
Brainstorm other ways the wolf might have fooled Red.  
DOK 2  
Write the text messages between Red and her mother explaining the wolf incident.  
DOK 3  
Write a new ending to this story.  
DOK 4  
Apply the theme of this story to compose a new fairy tale with different characters and a different story line. |
Rigor Misconception # 4

Depth of Knowledge is about greater difficulty, things getting harder.

If you look up the word ‘rigor’ in the dictionary, you’d see the synonyms inflexible, hard, rigid, and strict; cognitive rigor is the opposite—it’s flexible thinking, seeing multiple possibilities, multiple approaches, and different possible perspectives. Consider how many of us used to teach argument writing. We would say, “First state a claim. Then go and find some facts to support it.” That’s an ineffective way to teach argument writing and does not require very rigorous thinking. As a matter of fact, it was hard to produce a solid piece of writing using this approach.

What we’ve learned is to say, “Get into the topic deeply enough so you can start to see different perspectives emerging. Now decide which side you are going to defend and begin to locate the evidence to support that position.” This approach is more cognitively rigorous than the first example because to uncover multiple perspectives means to understand the topic in a much deeper and broader way. Debate coaches often require students to fully prepare for either side of the debate. Debaters have to be flexible enough to know and use the evidence on each side so they can argue for either the claim or counter claim at a moment’s notice. That’s cognitive rigor.

Is cognitive rigor about difficulty, things being harder and harder to do? Not really. Cognitive demand is about the complexity of the task and the mental processing required to complete it. Learning how to ski is usually hard at first, but with practice the routine act of skiing becomes easier. Many things we learn are difficult to do at first, but once we memorize the rules and routines they become easier, more automatic. Learning to decode words may be a hard task that becomes easier with practice, because it is routine. You use the same rules and strategies every time. Determining an author’s purpose, theme, or potential bias is more complex, because with each new text the application of reading skills leads to both near and far transfer and deeper understanding than simply calling words.

Sources cited


